PATENT SPECIFICATION

595,504

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PROVISIONAL SPECIFICATION

Improvements in or relating to Machines for Moulding Dough and like Plastic Material

I, DAVID AYRES JONES, a British Subject, of 68, Manor Road, Manselton, Swansea, do hereby declare the nature of this invention to be as follows:—

My invention relates to a combined pinning and moulding machine for dough and the like.

The present available machines are of fairly large proportions, and hence take up a considerable amount of floor space, also they need more than one operator to work same satisfactorily

My machine saves considerable floor space by virtue of the fact that it is of small dimensions, compact, and utilises both the top and bottom flights of an endless belt or band conveyor, the machine can be operated in a confined area, and needs one operator only to work same, as the dough piece is fed in and returned to the one end, the processed dough piece is positively ejected on to the delivery plate.

The objectionable features of the present available machines are their large construction, making a high initial cost, also as more than one operator is needed the operational cost is necessarily heavier.

My aim in this invention is to provide the bakery trade with a moderately priced machine for pinning and moulding, both in initial and running costs, light and easily transportable, and particularly suitable for the small bakery business.

My invention consists of a combined pinning and moulding machine, adjustable for processing varying weights and shapes of dough. The construction of an example of the machine is illustrated in the accompanying drawing and comprises two adjustable sheeting rolls, *a*, spring loaded and fitted with a safety cut out device operated by the rolls parting when same accidentally receive any unwanted foreign object, such as, the hand, etc. For the pinning process the dough piece is fed into the hopper, *c*, and then through the sheeting rolls, *a*, on to a receiving plate or shoot, *b*, from which the pinned dough piece is removed.

For the moulding process, plate, *b*, is lowered to the dotted position, b_1, the dough piece to be moulded is fed into the hopper, *c*, through the sheeting rolls, *a*, on to an endless flexible belt or band conveyor, *d*, the conveyor carries the sheeted dough piece to the curling plates, *e* and *f*, plate, *e*, partially curls the dough piece as the leading edge strikes same, plate *f*, finishes the curling and also retains plate, *e*, in its raised position to prevent plate, *e*, fouling the " tail " of the dough piece, when the latter is conveyed from plate, *f*, both *e* and *f* return to their normal positions. The curled dough piece is transferred to the underside flight of the conveyor, *d*, by a curved self adjusting transfer plate (*g*).

The final moulding operation is performed between the underside of the bottom flight of the conveyor, *d*, and an adjustable pressure board, *h*, for various weights of dough.

Dated the 13th day of March, 1945.

DAVID AYRES JONES.

COMPLETE SPECIFICATION

Improvements in or relating to Machines for Moulding Dough and like Plastic Material

I, DAVID AYRES JONES, a British Subject, of 68, Manor Road, Manselton, Swansea, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to machines for moulding dough and like plastic material of the kind in which quantities of material are fed to a continuous belt conveyor and while on the belt are moulded into a desired form.

In known machines hitherto employed for dough moulding, the coiling of a flat strip fed to the conveyor and subsequent

pressing and moulding operations are performed while the material is travelling on the top run of the belt and the finished moulded article is delivered at a position of the machine remote from that at which the dough was initially fed to it.

An object of the invention is to provide a machine which occupies comparatively little space and is economical to construct and operate.

According to the invention a machine for moulding dough and like plastic material comprises means for feeding lengths of material in strip form to a conveyor belt run, means for coiling each length of material while the material is being carried on said belt run, means for guiding the coiled lengths of material in succession to a space between a pressure board and a further conveyor belt run disposed below and running in the opposite direction to the movement of the first-mentioned belt run, the said space being further defined by side members disposed adjacent to the said further belt run and the pressure board and arranged so as to serve as mould surfaces which limit lateral spreading of the material while the material is being pressed between the said further belt run and the pressure board and is being moved by the last-mentioned belt run.

The invention is illustrated by way of example by the accompanying drawings in which Fig. 1 is a sectional view looking from the side of a combined dough pinning and moulding machine with the nearer side removed and Figs. 2 and 3 are views of the coiling flaps or plates in different stages of operation.

Referring to the drawings, a hopper 1 is adapted to receive a measured quantity of dough and direct such quantity to rollers 2 and 3, from between which the dough falls on to the top run of an endless belt conveyor 4. The roller 2 is carried by a carriage 5 which is movable on guide surfaces, not shown, and the position of are carriage 5 and consequently the roller 2 in relation to the roller 3 is adjustable from the front of the machine by means of a hand wheel 6 and screw-threaded shaft 7 which turns in a nut mounted on the carriage 5.

The dough reaches the top run of the conveyor 4 in the form of a strip 8 (Figs. 2 and 3). When the leading edge of the strip 8 reaches the flap 9 carried by pivots 9a, this leading edge pushes the flap 9 upwards and, as the conveyor 4 moves on, the remaining portion of the strip 8 passes below the leading edge which subsequently falls down to the position shown in Fig. 3. Owing to the comparatively light weight and short length of this flap the leading portion of the strip is only coiled through approximately one complete turn. During this coiling operation by the flap 9 a ratchet bar 10 (See Figs. 2 and 3) which is pivotally connected to the flap 9 by the pivot 11 moves upward over a stop 12. When the coiling operation of the flap 9 is completed, a tooth on the bar 10 engages with the stop 12 and the bar 10 and flap 9 are thus prevented from falling back to their original position when the conveyor has moved the coiled leading portion of the strip 8 towards a second flap 13. The flap 9 is thus prevented from falling back on to the trailing uncoiled portion of the strip 8. The second flap 13 is carried by pivot 13a, and its weight and length are such that it is able to complete the coiling of the strip 8 which was commenced by the flap 9.

During the coiling operation performed by the flap 13, this flap is lifted and, when coiling is completed or nearly completed, a tail-piece 14 carried on the flap 13 strikes the ratchet bar 10 and moves the latter away from the stop 12 whereupon the bar 10 and flap 9 drop to their original position. By this time the strip 8 has passed completely from under the flap 9. For the sake of clarity of illustration the parts 10, 12 and 14 have been omitted from Fig. 1. The strip coiling device referred to above is the subject of co-pending Application No. 13886/47 (Serial No. 595,544).

The completely coiled piece of dough now passes to the end of the conveyor 4 and falls between this end and a guide member 44 which (in the example illustrated) is supported by pivots 44a, so as to be oscillatable towards and away from the adjacent end of the conveyor 4. The guide member 44 is loaded by a weight 15 integral with the guide member so that the latter is able to adjust its position according to the size of the coiled dough piece which falls between it and the conveyor. As dough strips of the same weight may be coiled into pieces of different linear dimensions this self adjusting property of the guide member 44 is valuable and is even more so when strips of different weights are coiled on the upper run of the conveyor. Stops, not shown, are advantageously provided to limit the oscillatory movement of the guide member 44. The guide member also serves to consolidate the coiled dough piece by the pressure which it exerts on the piece.

It will be noted that the passage afforded by the guide member 44 and the conveyor narrows towards its lower end.

The dough piece passes from between the end of the conveyor 4 and the guide member 44 to the space between the lower

or opposite run of the conveyor 4 and a pressure member 16. This pressure member 16 is carried on arms 17, 18 which are mounted so as to be oscillatable about their lower ends and are pivotally attached to the lower side of the pressure member by lugs 19.

The distance between the lower run of the conveyor 4 and the pressure member 16 is adjustable by means of a handwheel 20 at the front of the machine and screw threaded spindle 21 which engages in a nut (not shown) mounted on the front end of the pressure member. The pressure member 16 presses the dough piece against the lower run of the conveyor to mould the said piece into the desired form. In order to prevent undesirable lateral spreading of the dough piece while it is being moulded by the pressure member 16 and the lower run of the conveyor belt into a long loaf, side members are disposed adjacent the lower run of the belt run and the pressure member 16 so as to provide lateral walls confining the space into which the dough piece is moved. In the construction illustrated in Fig. 1 the opposite side walls 35, one of which is shown in Fig. 1, of the machine serve as the said side members as these walls are located closely adjacent to the edges of the conveyor belt and the pressure member 16. The upper face of the pressure member 16 may be flat, concave or convex as seen in transverse section. A rigid plate 37 is fixed so as to back against the lower run of the belt and prevent the latter moving under pressure from a dough piece.

The moulded dough piece emerges from the space between the conveyor and the pressure member 16 on to a delivery plate or chute 22 at the front of the machine.

Both the loading of lumps of dough into the hopper 1 and the delivery of the moulded pieces thus takes place at the same end of the machine. Provision is made for inserting either the same delivery plate 22 or a second such plate at an opening in the front of the machine so that the delivery plate thus inserted catches the strip emerging from between the rolls 2 and 3 before it reaches the conveyor 4. The position of the delivery plate for this use of the apparatus as a pinning machine is shown in dotted lines in Fig. 1.

The conveyor 4 and rolls 2, 3, are suitably driven from a suitable power source, for example an electric motor, not shown, by a main driving chain or belt 23, which rotates a wheel or pulley 24 mounted on a shaft which also carries a second wheel or pulley 26. This latter wheel or pulley 26 drives a chain or belt 27 which by wheels or pulleys 28, 29 drives a further chain or belt 30. The belt 30 in turn drives the conveyor 4 and rolls 2, 3, by means of the wheels or pulleys, 31, 32 and 33.

Instead of being loaded by a weight 15, the guide member 44 may be urged by a spring towards the conveyor ends and may be arranged to be moved bodily instead of being pivotally mounted.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A machine for moulding dough and like plastic material which comprises means for feeding lengths of material in strip form to a conveyor belt run, means for coiling each length of material while the material is being carried on said belt run, and means for guiding the coiled lengths of material in succession to a space between a pressure board and a further conveyor belt run disposed below and running in the opposite direction to the movement of the first-mentioned belt run, the said space being further defined by side members disposed adjacent to the said further belt run and the pressure board and arranged so as to serve as mould surfaces which limit lateral spreading of the material while the material is being pressed between the said further belt run and the pressure board and is being moved by the last-mentioned belt run.

2. A machine as claimed in Claim 1 which comprises fixed means for preventing movement of the said further belt run, from a fixed position, in the direction away from the said pressure board.

3. A machine as claimed in Claim 2 which comprises means for adjusting the position of the said pressure board towards and away from the said further belt run.

4. A machine as claimed in any of the preceding claims which comprises a pair of rolls arranged to deliver a strip of material to the conveyor belt run and means operable from outside the machine for displacing one of the rolls towards and away from the other roll.

5. A machine as claimed in any of the preceding claims which comprises means for receiving and holding a delivery plate or chute between rolls for delivering a strip of material to the conveyor belt run and the conveyor belt run whereby the strip is delivered directly to the outside of the machine without passing to the said conveyor belt run.

6. A machine as claimed in any of the preceding claims in which the means for guiding the material from the first men-

tioned belt run to said further belt run comprises a member disposed adjacent an end of the conveyor means and displaceable under the action of the moulded piece passing between the said member and the end of the conveyor means so that the distance between the guide member and the end of the conveyor means is varied according to the size of the moulded piece of material passing there between.

7. A machine as claimed in Claim 6 in which the guide member is pivotally mounted so that its end adjacent said further belt run is oscillable towards and away from the conveyor means, the guide member being biassed by loading means towards the conveyor means.

8. A machine as claimed in any of the preceding claims wherein the coiling means comprises a number of flaps pivotally mounted directly on a fixed support located above the belt run to which the lengths of material are fed, each flap presenting a surface adjacent the belt run which is convex to the said belt run and is inclined downwards and forwards in the direction of movement of the belt run.

9. A machine for moulding dough and like plastic material according to Claim 1 substantially as described with reference to the accompanying drawings.

Dated this 18th day of February, 1946.

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33, St. Mary Street, Cardiff.

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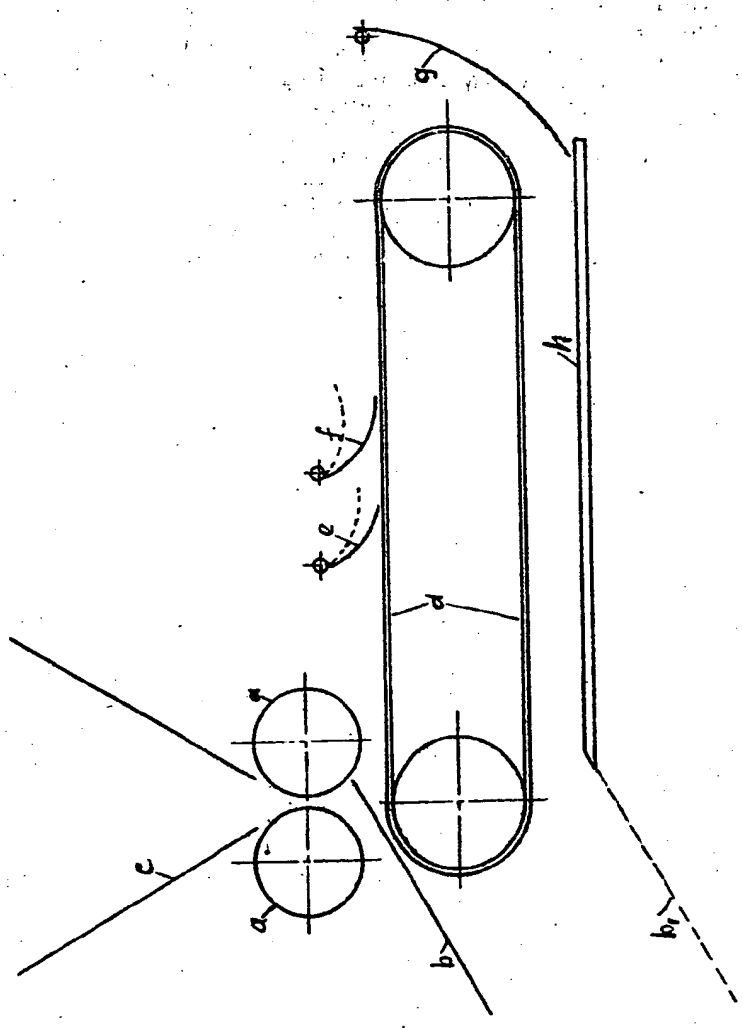

H.M.S.O. (Ty.P.)

595,504 COMPLETE SPECIFICATION 1 SHEET

[This Drawing is a reproduction of the Original on a reduced scale.]

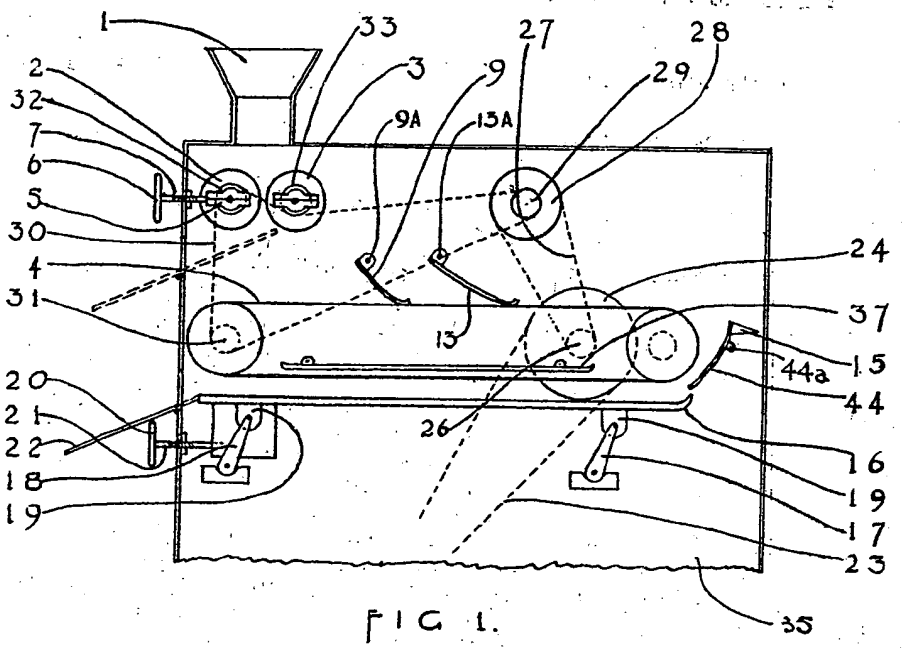

FIG 1.

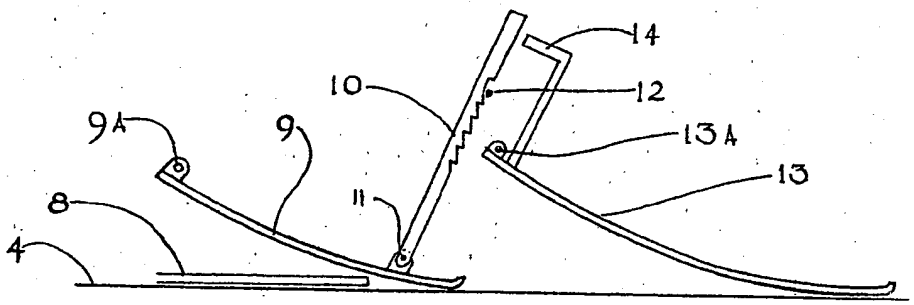

FIG 2.

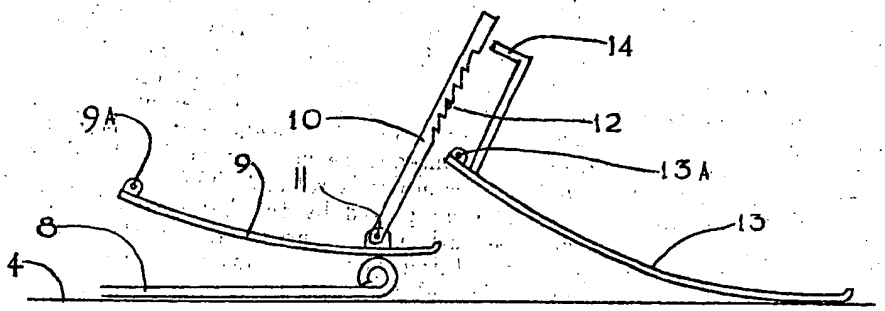

FIG 3.

H.M.S.O.(Ty.P.)